are pending.

What the Art Doesn't Teach

The invention adds or mixes activated spores to improve and accelerate the malting process of a cereal. This results in increased enzymatic activity (see pages 4-5 and 14 of the specification) and acrospire length, especially in the later stages of the malting process (see Table at the top of page 36 of the specification). As will be more fully discussed below, Gyllang et al. do not suggest the use of activated spores.

Gyllang doesn't teach introducing activated spores into cereal at a base level of $1x10^2$ per gram of dry cereal of activated spores. See claim 1 as amended and page 13 of the specification which supports $1x10^2$. Indeed, Gyllang does not teach any addition of activated spores.

Gyllang does not teach mixing water, a cereal and activated spores and holding the combination for a time and temperature effective to increase enzymatic activity relative to a combination without activated spores. {See claims 18, 48 and 64, and see page 6 of the specification for support of this portion of these claims; also see page 30 (top) for such support.}

As discussed at the interview, applicants invention contemplates the loading of activated spores into a malting process for new and unexpected results of improved malting, enhanced enzymatic activity and improved acrospire growth. This activity does not exist without the use of activated spores.

Just using dormant spores as per Gyllang does not achieve the same results even if you assume that some dormant spores are activated during the malting process after they are added to a cereal which undergoes malting. Reference to the data in applicants' specification proves how different their invention is from what Gyllang did when that reference describes adding dormant spores to a malting process. In example 1 in the

application, the enzymatic activity that results from a malting process that adds dormant spores ("Nonactive") was compared to a malting process which adds activated spores ("Invention"). This data proves applicants' point of new, different and unexpected results from the addition of activated spores.

Example 1 Table, page 20 of the specification:

| | Non Active Spores | Active Spores | |
|---|---|---|---|
| β glucanese | 371 | 683 (C1) | 3856 (D1) |
| Xylanse | 34 | 56 (C1) | 984 (D1) |

Experiment D1 provides huge differences and C1 provides significant and substantial differences.

The data in the application also shows a significant increase in enzymatic activity over traditional malting processes.

Example 5 Table, pages 36-37 of the specification:

| | Traditional | Invention |
|---|---|---|
| β glucanese | 263 | 907 |
| Xylanse | 28.86 | 57.76 |

Example 6 Table, page 40 of the specification:

| | Traditional | Invention |
|---|---|---|
| β glucanese | 10.9 | 16,640 |
| Xylanse | 16.85 | 1,620.1 |

**Gyllang Teaches Away From Using Activated Spores.**

Even though Gyllang describes adding dormant spores and some small increased enzymatic activity, Gyllang still gets gushing. This gushing is reported at page 252 of the reference. He also reports that the number of spores not being important (see page 252). The level of activated spores as claimed in the instant application is important. Gyllang

describes his spores as metabolically inactive (see page 252, which confirms applicants' declarations).[1] True, Gyllang reports that there is some different enzymatic activity, but who would try to obtain such activity with the risk of gushing reported by Gyllang. Indeed, the malting conditions which might cause spore activation during malting were the very conditions which Gyllang suggested caused gushing.[2] Moreover, even if there is some spore activation during Gyllang's malting, the reference simply does not teach adding activated spores in sufficient quantity at a base level or a level which is sufficient and effective to improve enzymatic activity of the malt. (See page 13 of specification). As illustrated above, adding dormant spores does not attain the results of the invention.

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[1]At page 252 Gyllang states: "Although the pilot-plant tests were run under conditions that conformed as closely as possible to the conditions in the malting plant from which the gushing problem originated, it is quite clear that contamination which is arranged by submitting the barley grains to spore-infected steeping water is a process which differs very much indeed from natural contamination. The questionability of the situation stems from a possible exaggeration of the effects of the fungi, for instance in the case of the malt kernels being exposed to an exceptionally large number of spores in the steep water, as a result of which the extent of the effects may be misleading. On the other hand, the actual number of spores is probably less important than other factors since the spores themselves are metabolically inactive."

[2] At page 252 Gyllang also states: "It can be seen that A. Fumigatus and R. oryzae are both present in large quantities during the gushing period. After the germination floors, conveyor, belts, the kiln and so forth at the malting plant had been subjected to cleaning measures, the content of fungi in the malt was reduced and there was no more gushing."***** "Therefore, the use of fungal-contaminated barley cannot be given the blame for the gushing which arose. The gushing phenomenon was instead caused by conditions prevailing in the malting plant during the germination period which permitted and favored the growth of the A. fumigatus microorganisms." Hence, who would add an activated microorganism to a malting process after this statement????

**The Pending Claims**

Applicants recognize that the current rejecti n is "final", but request the Examiner to reconsider claim 1 as amended. Moreover, in view of the foregoing pending claims 48 and 64 should be allowed in the instant application.[3]

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[3] 48. A method for the preparation of a malted cereal product, the method comprising:

mixing water, activated spores and a cereal to provide a malting cereal composition, wherein said activated spores increase an activity of an enzyme that is present in a cereal used during said malting process and the activated spores are present in the malting cereal composition in an amount of at least 1 X $10^2$ per gram of air dry cereal, the amount of activated spores being effective for providing the malted cereal with the increased enzyme activity, the increased enzyme activity being greater than the enzyme activity which is obtained by a malting process without activated spores.

64. A method for the preparation of a malted barley, the method comprising:

mixing activated spores, a barley and water to provide a malting barley composition, the activated spores being present in an amount of at least about 1 x $10^2$ per gram of air dry barley to provide a malting barley composition;

holding the malting barley composition at a temperature of from about 5°C to about 30°C for a time effective for providing a wetted barley having a moisture content of at least about 20 weight percent,

the activated spores increasing an activity of an enzyme that is present in the barley used during said malting method, the activated spores being present in the malting barley composition in an amount which is effective for providing the malted barley with the increased enzyme activity, the increased enzyme activity being greater than the enzyme activity which is obtained by a malting process without activated spores, wherein the enzyme is selected from the group of β-glucanase, xylanase, amylase, Protease, naturally occurring enzymes in the barley and combinations thereof, and

wherein the activated spores are activated by treatments selected from the group consisting of

cycles of wetting and drying,

addition of nutritional supplies,

exposure to temperature changes within a range of about 0° to about 80°C,

exposure to changes in pH within a pH range of about 2.0 to about 8.0 to obtain spores where the size of the spores is increased by a factor between about 1.2 and about 10 over their dormant size and/or the spores have one or more germ

The Section 112 Rejections

Deposit of Microorganisms

Applicants will supply notification that the deposited microorganisms were deposited under the terms of the Budapest Treaty and are irrevocably and without restriction or condition released to the public. Alternatively, Applicants will redeposit the strains under the terms of the Budapest Treaty and provide the Examiner with evidence of that deposit. Applicants respectfully request that the Examiner issue a Notice of Allowability and Allowance with this formality as a condition of issuance.

Rejection of Claims 18 and 20

Claims 18 and 20 now recite a "holding time" and "holding temperature". Support for "holding time" and "holding temperature" can be found in the specification at page 5, lines 10-11.

Rejection of claims 53, 61 and 64

Claims 53, 61, 64 have been amended as suggested by the Examiner to delete "cycles of wetting, cycles of drying" and to delete "addition of spore elements". Because these amendments merely as to form, they should be entered "after final." See MPEP section 714.12.

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tubes per spore, and mixtures thereof.

In view of the foregoing, applicants and their attorney respectfully request that the Examiner allow the pending claims.

Respectfully submitted,

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